MITIGATION FOR RESERVOIR PROJECTS PART I: WILDLIFE MITIGATION PAST AND PRESENT

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INTRODUCTION

The environmental impacts of water development projects have recently become the source of considerable concern by various groups. A dichotomy has evolved in which there exists a continuing need to satisfy population water demands and a recognition that projects to accomplish these ends may cause irreversible adverse impacts (Hagan and Roberts 1973).

Mitigation for the loss of wetland habitat has been a major issue to resource managers and developers for only the past 15 years. In the interim, substantial progress has occurred in the evolution and acceptance of the concept; we are now at a time when we have enough knowledge and experience to review how effectively the concept has been implemented (LaRoe 1986).

For the portion of Georgia north of the Fall Line, a network of public fishing and water supply reservoirs was proposed to ensure future water supplies. A need for 31 reservoirs was identified (Cowie and Cooley 1988). What avoidance, restoration/ creation criteria and techniques should those proposing to impact wetland tracts apply for reservoir mitigation in each instance?

The scope of this paper is to present the evolution of the wetland mitigation concept with respect to reservoir development. A review of case histories and evaluation of our progress is presented with a specific emphasis on mitigation for wildlife.

MITIGATION POLICY

The mitigation policy adopted by the United State Fish and Wildlife Service in 1981 (USFWS 1981) is the baseline used for addressing the mitigation issue. The policy outlines the approach to determine what is important in terms of agency concerns and in the levels of mitigation to be pursued as a matter of agency policy (Shanks and Misso 1986).

The USFWS uses the definition of mitigation contained in the Council on Environmental Quality's National Environmental Policy Act regulations (40 CFR Part 1508-20 (a-e)) for its mitigation policy. By this definition mitigation can include: 1) avoiding the impact altogether by not taking a certain action or parts of an action; 2) minimizing impacts by limiting the degree of magnitude of the action and its implementation; 3) rectifying the impact by repairing rehabilitating or restoring the affected environment; 4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and 5) compensation for the impact by replacing or providing substitute resources or environments.

REGULATORY HISTORY

Mitigation of impacts to fish and wildlife resources is a concept that has evolved over the past 30 years. The Fish and Wildlife Coordination Act (FWCA) of 1934 (Public Law (P.L.) 73-121) identified the potential for negative impacts on fish and wildlife. Fish resources were first given consideration in the planing and construction of federal water development projects (Rappoport et al. 1977). Provisions for the consideration of wildlife in water projects were made with the amendment of FWCA act in 1946 (P.L. 73-732). In 1958, the act was amended again to include the enhancement of fish and wildlife resources in connection with water developments (P.L. 85-624). It was at this time the authority of the act was expanded to include proposed and authorized projects, and the term "mitigation" was first used in connection with wildlife. However, the definition and philosophy behind mitigation have been inconsistent and unclear among the agencies connected with its use (Rappoport et al. 1977, Rappoport 1979).

EVOLUTION OF WATER SUPPLY DEVELOPMENT AND LEGISLATION

Water supply development is an activity so old that it goes far back into the realms of legend. If irrigation agriculture was practiced in Jericho in 7000 B.C., then water development has existed for almost nine millennia (Teclaff and Teclaff 1973).

The first proposal for wetland habitat mitigation was only 15 years ago, and it involved a proposal between the state of Florida and Marco Island Development Corporation to deed certain habitats. Wetlands and uplands of high public value to were to be deeded on an acre for acre basis, as a condition of permit approval for development in other wetland and upland areas (LaRoe 1986). The mitigation for this several thousand acre permit was on a habitat/ecosystem bases, rather than being directed to a single species, as had been the practice (LaRoe 1986).

From a historical perspective, it can be shown that the physical limitations of individual river basins imposed quite powerful constraints on water use. Little could be done, for example, to increase the amount of water available for irrigation, power, or municipal supply until modern technology permitted large-scale diversion from basins amply endowed with water. Similarly, until the advent of concrete dams for storage and of long-distance transmission of electricity, power from water could be used only on-site and was subject to seasonal fluctuations.

During the nineteenth century in the United States, as in Europe, water laws were introduced to cope with the growing demand for water under the pressure of industrialization. One of the first laws, the natural flow doctrine, required that water not be sensibly diminished or depleted except for domestic uses. This reflected the interdependence of waters and unity of the river basin by recognizing the community and the interests of the landowners bordering on the flowing waters.

The reasonable use doctrine that appeared around the middle of the century abandoned the insistence on an undiminished flow of water, and in its unrestricted version, permitted any use of water by a riparian owner which appeared reasonable to the courts. Prior to the riparian doctrine, mill laws permitted riparian owners, upon payment of compensation, to erect dams that were injurious to other owners. They were justified either on the ground that the authorized mills were in the public interest, or that the state had power to regulate the rights of riparian owners in their interest. The mill acts were the first opening for governmental incursion into the field of water resources.

The 1930's marked the high point of a long progression, a convergence of three distinct concepts; multi-purpose projects, river basin planning, and regional development, along with a parallel convergence of various stands of authority in the federal government.

Not until 1955 did the word "conservation" appear in the stated objectives of compacts; for example the 1955 Columbia Interstate Compact and in the Delaware River Basin Compact (Teclaff and Teclaff 1973).

The harvest of more than two centuries of environmental exploitation was not brought home to the nation until the 1960's when a revived conservation movement drew attention to the damage. As late as 1969, a federal district court in Florida interpreted the statutes of the COE which authorize the control of development in navigable waters as pertaining solely to navigation and anchorage. The COE was considered powerless to refuse a permit on ecological grounds, even when it was shown that the projected private dredging and filling would substantially damage the ecology of an entire large bay.

Such omissions of environmental considerations has lead to more than one-third of the nations's wetlands having been permanently destroyed by development. By 1931 the states of Iowa, Missouri, Wisconsin, Illinois, Ohio, and Michigan had lost nearly 90 percent of their original wetlands (Teclaff and Teclaff 1973).

The loss of free-flowing rivers through regulation for flood control, channeling, reservoir construction and other purposes has been perhaps the least-noted of the sources of wetlands deterioration until its cumulative effects are finally realized. For example it was not until 1954 that Wisconsin realized that only 770 miles of its original 10,000 miles of free flowing rivers still remained. Ultimately, some small portion of the remaining was saved by the Wild and Scenic Rivers Act of 1968 (Teclaff and Teclaff 1973).

In the water-resources field there was little federal legislation of any kind

specifically pertaining to environmental factors until the Federal Water Pollution Control Act of 1948, and its Amendments of 1956. During the 1960's almost every year brought one or more major pieces of legislation: the Watershed Protection and Flood Prevention Act Amendments (1961); the Water Resources Research Act (1964, and amendments, 1966); the Land and Water Conservation Fund Act 1964; the Water Resources Planning Act, the Water Quality Act, and Water Project Recreation Act all of 1965, the Clean Waters Restoration act of 1966, the Wild and Scenic Rivers Act 1968, the National Environmental Policy Act of 1969, and the Water Quality Improvement Act of 1970.

The most notable result of this legislative avalanche has been a rectification lack of concern for environmental deterioration. The National Environmental Protection Act of 1969 mandated this concern generally, and the Water quality Improvement Act of 1970 mandated it specifically for water resources development.

CURRENT WILDLIFE MITIGATION

Generally, mitigative steps depend on project policy measures or project modifications (Rappoport et al. 1977). Prosser et al. (1979) discussed fish and wildlife mitigation associated with selected COE projects. Of the 10 projects studied mitigation/ compensation recommendations fell into the following categories: 1) operation of selected project lands by state or federal wildlife agencies; 2) land acquisition; 3)habitat enhancement; 4) fish/wildlife community manipulation; 5) provision of facilities to accomplish resource utilization; and 6) continuing investigations. Seven of 10 projects specifically license a total of 77,008 acres for wildlife management to attain mitigation/compensation for the loss of 204,360 acres permanently flooded. In addition, 39,000 acres of fee lands above conservation pool lands receive wildlife management by the COE. Sixteen large scale water resource development projects were studied concerning lands required for wildlife mitigation. A total of 116,288 acres of licensed lands were required to mitigate for 373,090 acres of land permanently flood. For these selected projects, 31 acres of licensed wildlife management lands were obtained for every 100 acres of flooded project lands.

Licensing of Lake Oconee, a 19,050 acre-reservoir located in the Piedmont of Georgia, required no mitigation lands for enhancement of impacted wildlife populations. However, 52 five-acre fish plots and 42 wildlife habitats consisting of standing timber in the lake basin were required. Three major recreation areas, each 85 acres in size, consisting of a boat ramp, beach, campground, comfort station, and day-use area along with the fish plots and wildlife habitats constituted mitigation for this project.

Wood and Swift (1979) discussed wildlife conservation associated with 10 federal water resource development projects in the Southeast. Case history reviews revealed that the inclusion of the following factors in conservation strategy developments would have a favorable influence on conservation efforts: 1) a soundly conceived plan to satisfy legitimate human needs and/or desires; 2) a plan which is compatible with project design, scheduling and timing; 3) a coordinated effort involving national, regional, and local interests must be established early in plan formulation and implementation; 4) favorable support and/or lack of strong opposition from local conservation and development organizations; and 5) all groups involved must persevere to ensure authorization and implementation of recommendations.

Passmore and McKern (1982) discussed the implementation of the Lower Snake River fish and wildlife compensation plan. From 1958 to 1975, the construction of four multipurpose water development projects on 150 miles of the lower Snake River resulted in substantial impacts to fish and wildlife resources. To mitigate fish and wildlife losses caused by the construction and operation of lock and dam projects, a wildlife compensation plan was developed. Project-caused upland game bird losses were partially compensated for by the purchase of 395 acres of riparian habitat. Compensation of nongame species was substituted by additional hunting opportunities. To compensate for lost hunter-day-use the COE stocks game birds on the project and acquired off-project lands. The stocking effort will consist of 20,000 birds per year for 20 years at which time the habitat and natural brood stock should be established.

CONCLUSIONS

Many studies have reported wildlife mitigation measures associated with water resource development projects. Each study recognizes the importance and need for mitigation in natural resource development projects. However, in each situation there is frequently a gain for some species and a loss for others. Each situation is unique and the ability to

fully compensate for losses to wildlife for such large scale wetland losses is not practicable. The success of mitigation plans and the species benefits from permitted projects will depend upon those involved with the planning and the economic/ political arena encompassed by the project.

Under the current regulatory program, mitigation conditions are imposed on about one-third of all permits processed annually; in comparison, less than 5 percent of all applications are denied.

The basic approaches for mitigating losses have remained the same and include the following goals:

- o avoid the wetland completely
- o apply various measures for reducing damage or destruction
- o restore the damaged wetland or attempt to recreate wetland off-site
- o acquire a wetland at some other location to compensate for damage or destruction.

The studies reviewed here indicate that compliance with permit conditions has occurred but the effectiveness of the mitigation in preserving our wildlife and fisheries resource is questionable. We have accomplished a great deal in terms of the development of regulations and guidelines for the protection of our wildlife/fisheries resources. However, the effectiveness and success of our mitigation attempts still appear inadequate. The above studies as well as many others (Armacoot 1979, Horak 1979, Mathies and Barrett 1979, Voight and Nagg 1979, and Wells 1980) indicate that mitigation often does not adequately offset or compensate for the impacts of water development activities.

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